

ABSTRACT OF THE DISCLOSURE

Methods and kits for decomposing organophosphorus compounds in non-aqueous media at ambient conditions are described. Insecticides, pesticides, and chemical warfare agents can be quickly decomposed to non-toxic products. The method comprises combining the organophosphorus compound with a non-aqueous solution, preferably an alcohol, comprising metal ions and at least a trace amount of alkoxide ions. In a first preferred embodiment, the metal ion is a lanthanum ion. In a second preferred embodiment, the metal ion is a transition metal.